

# **Technology Performance Verification Testing Through the U.S. EPA Environmental Technology Verification (ETV) Program**

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*2010 INTERNATIONAL WORKSHOP ON ENVIRONMENT AND ENERGY  
“Global Collaboration in Sustainable Environmental and Alternative Energy Strategies”  
November 3, 2010*



# US EPA Environmental Technology Verification (ETV) Program Objectives



- Provide credible performance information for commercial-ready technology to help solve high-risk environmental problems. Help -
  - **Purchasers** in making decisions to purchase innovative technologies
  - **Policymakers and Regulators** in making policy and permitting decisions for innovative technologies
  - **Vendors/Developers** in selling and further developing innovative technologies

# ETV Helps Technology Commercialization and Innovation



# ETV Verification Process



EPA, verification  
organizations, stakeholders



With stakeholders,  
develop test  
protocols, quality-  
assurance test  
plans

AND



Conduct  
technology  
testing,  
audits



Identify priority  
technology  
categories



Identify vendors,  
collaborators



Write verification report

ETV Outreach

[www.epa.gov/etv](http://www.epa.gov/etv)



# Six ETV Centers

- ETV **Air Pollution Control Technology Center**  
*RTI International*
- ETV **Advanced Monitoring Systems Center**  
*Battelle*
- ETV **Drinking Water Systems Center**  
*NSF International*
- ETV **Greenhouse Gas Technology Center**  
*Southern Research Institute*
- ETV **Water Quality Protection Center**  
*NSF International*
- ETV **Materials Management and Remediation Center**  
*Battelle*

Plus: ETV ESTE - Environmental and Sustainable Technology Evaluation

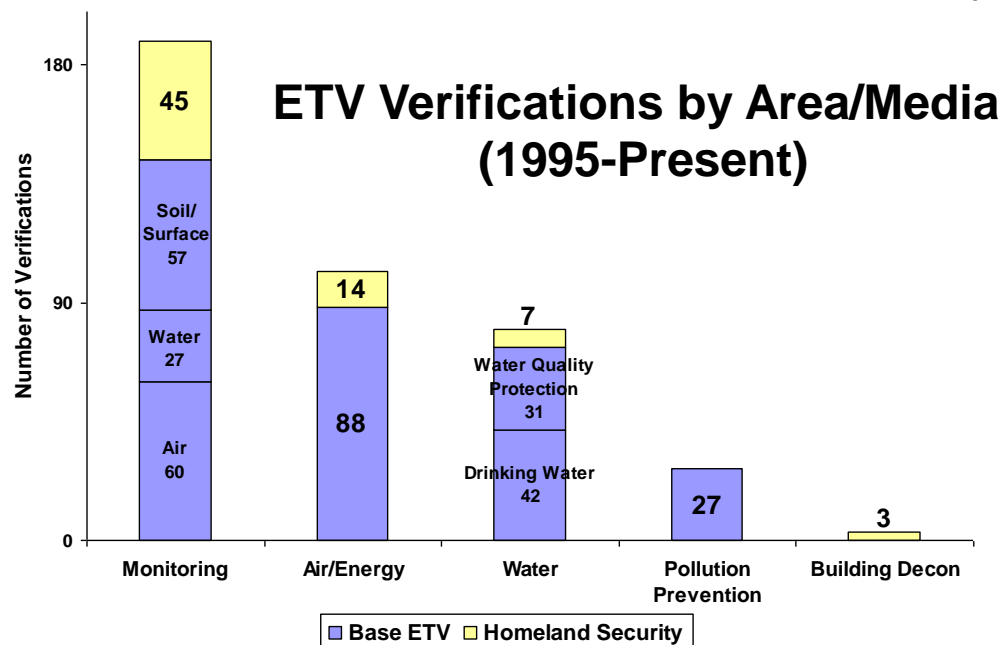
# Center Operations

- Each Center addresses different types of environmental technologies
- Voluntary program for vendors that makes objective performance information available to help decision-making
- Guided by the expertise and support of stakeholders (representative verification customers) in technology prioritization, protocol development, collaboration/co-funding, and external peer review
- Coordination with international ETV programs
- Collaboration, vendor cost-sharing, and leveraging of funds are essential components



# ETV at a Glance

- Collaborations and vendor cost-sharing leverage ETV, generating 80-90% of funding in last two years
- 426 verifications, 92 protocols completed
- Over 300 stakeholders active in advisory groups and technical panels
- Web and international interest (>1.1 M hits/year)



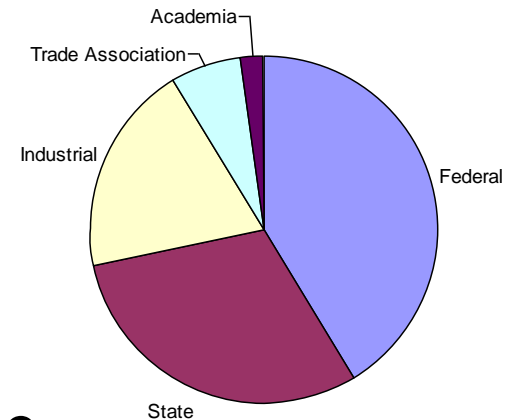
# Technology Vendor Interest in ETV

- Domestic and international market potential once verified
- Independent technology verification is required by rule or regulation, or is condition of purchase
- Competition between vendors
- Grant can provide leveraging support for verification
- Information dissemination potential
  - EPA web site; tech briefs; conferences; press days
- Return on investment



# ETV Stakeholder Organizations

- Bayer
- Northeast Waste Mgt Officials Association (NEWMOA)
- US EPA
- Dow
- States of NE, RI, OH, NJ, CT, NY, TX, VT, CA, OR
- VA Tech
- American Petroleum Institute
- Northeast Recycling Council
- USDA
- US Navy
- USACE
- DuPont
- USGS
- Shell
- US Air Force
- BP
- US DOE
- SERDP/ESTCP
- Chevron



# Stakeholder vs Collaborator

- Stakeholder: Active participant in advisory panel to support overall Center activities; can also serve as a collaborator
- Collaborator: Provides support (funding and/or in-kind services) for a specific verification test; not necessary to also be a stakeholder
- Potential Commitments and Contributions
  - Meeting participation (quarterly telecons)
  - Assist in identifying or provide funding support for test
  - Assist in identifying or provide in-kind contributions
    - Personnel (technology operators; site support)
    - Site and associated logistics (access, power, shelter, etc.)
    - Reference sampling and/or analyses
    - Review test/QA plans and reports

# Typical Delineation of Responsibilities State-Federal-Private Sector Collaboration

- **Vendor(s)**: Provide technology and all supplies for testing; funding contribution; in-kind support for testing; review/approve QAPP; review verification report.
- **Collaborator(s)**: Identify and secure access to sites; provide or help identify field test support; funding contribution for testing.
- **EPA**: Technical, programmatic, QA oversight; potential funding contribution
- **Battelle/ETV**: Secure relationship with vendor(s); preparation of QAPP; conduct laboratory and/or field testing; QA auditing; prepare verification report(s)/statement(s); small cost share

## Relevant ETV Advanced Monitoring Systems (AMS) Center Verifications

Category	Technology Providers	Collaborators
Pressure Control for Assessment of Vapor Intrusion	GSI Environmental	US Navy SPAWAR
Asbestos Field Samplers	Environmental Quality Management	EPA Office of Solid Waste and Emergency Response
Automatic tank gauging leak detection systems for biofuels	TBD	EPA Office of Underground Storage Tanks; National Working Group on Leak Detection Evaluations
Carbon sequestration monitoring	Picarro	EPA Office of Water
Ozone indicator cards	Enviroscan	Breathe California of Los Angeles, South Coast Air Quality Management District
Leak detection and repair technologies	FLIR Systems Gas Imaging Technologies	EPA Office of Research and Development, Texas Chemical Council, American Chemistry Council



# **ETV Materials Management and Remediation Center Scope**

- ✓ Recycling
- ✓ Beneficial use of waste materials
- ✓ Recovery of useful components of waste
- ✓ Treatment to minimize disposal requirements
- ✓ Remediation

# MMR Priority Technology Categories

- ISCO at gas station sites
- 1,4-Dioxane remediation
- Fracturing
- Reactive capping
- Ex situ treatment for sediment reuse
- Anti-corrosion tank sprays
- Medical waste treatment
- Accelerated plastics recycling

# Summary

- ETV program has six centers.
  - ETV MMR Center is in its last year of operation; ETV AMS Center will operate through FY12.
- Parties interested in getting a technology verified, please reference the web page ([www.epa.gov/etv](http://www.epa.gov/etv)) to identify the correct center.
- Potential site owners, please let me or a co-author know.
- Potential stakeholders for the AMS or MMR Center, please let me or a co-author know.